

What is Claimed Is:

- 1        1.     A method of improving uniformity of plasma etching, comprising the  
2 steps of:
  - 3                etching a wafer with a free radical plasma;
  - 4                exposing said wafer to infrared energy from an infrared energy source;
  - 5                and
  - 6                attenuating said infrared energy in a predetermined pattern to reduce non-  
7 uniformities.
- 1        2.     The method of claim 1, wherein said infrared energy comprises resonant  
2 infrared energy.
- 1        3.     The method of claim 2, wherein said step of attenuating said infrared  
2 energy in a predetermined pattern to reduce non-uniformities comprises positioning a  
3 filter having a predetermined pattern of variable transmittance regions between said  
4 infrared energy source and said wafer.
- 1        4.     The method of claim 3, wherein said predetermined pattern of said filter  
2 comprises an outer perimeter having a first transmittance and a center portion having a  
3 second transmittance.
- 1        5.     The method of claim 4, wherein said first transmittance is lower than said  
2 second transmittance.

1           6.       The method of claim 3, wherein said predetermined pattern of said filter  
2   comprises a series of eccentric regions of gradually decreased transmittance.

1           7.       The method of claim 3, wherein said predetermined pattern of said filter  
2   comprises a first region having a first transmittance and a plurality of second regions  
3   having a second transmittance.

1           8.       The method of claim 1, further comprising the step of filtering said  
2   infrared energy to have a resonant frequency.

1           9.       The method of claim 8, wherein the steps of filtering said infrared energy  
2   to have a resonant frequency and attenuating said infrared energy in a predetermined  
3   pattern to reduce non-uniformities comprise positioning a filter between said infrared  
4   energy source and said wafer.

1           10.      The method of claim 8, wherein the steps of filtering said infrared energy  
2   to have a resonant frequency and attenuating said infrared energy in a predetermined  
3   pattern to reduce non-uniformities are performed by a single filter.

1           11.      A filter for reducing non-uniformities in a plasma etching process,  
2   comprising:  
3                 a first region having a first transmittance; and  
4                 a second region having second transmittance that is different than said  
5   first transmittance level.

1           12.    The filter of claim 11, wherein said first region comprises a perimeter of  
2    said filter and said second region comprises a center portion of said filter.

1           13.    The filter of claim 12, wherein said first transmittance is lower than said  
2    second transmittance.

1           14.    The filter of claim 11, wherein said first region and said second region are  
2    eccentric.

1           15.    The filter of claim 11, wherein said second region is positioned to reduce  
2    transmission in areas where said plasma etching process experiences magnetic field  
3    cuspings.

1           16.    The filter of claim 11, wherein said filter comprises optical quality glass  
2    having a layer of metallic coating of a predetermined thickness.

1           17.    The filter of claim 11, wherein the thickness of said layer of metallic  
2    coating varies to form said first and said second regions.